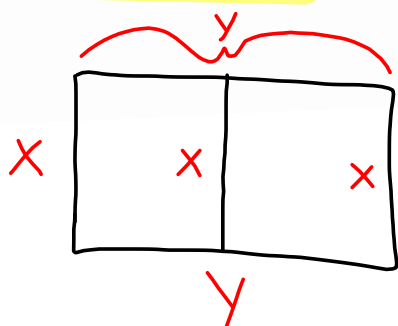


3. A 384-square-meter plot of land is to be enclosed by a fence and divided into two equal parts by another fence parallel to one pair of sides. What dimensions of the outer rectangle will minimize the amount of fence used?



Area is secondary eq:

$$\frac{384}{x} = \frac{xy}{x}$$

$$y = \frac{384}{x}$$

Rest: $x > 0$
 $y > 0$

Minimize: $3x + 2y$

Minimum Fence = $3x + 2\left(\frac{384}{x}\right)$

$F = 3x + 768x^{-1}$

$F' = 3 - 768x^{-2}$

$F' = 3 - \frac{768}{x^2}$

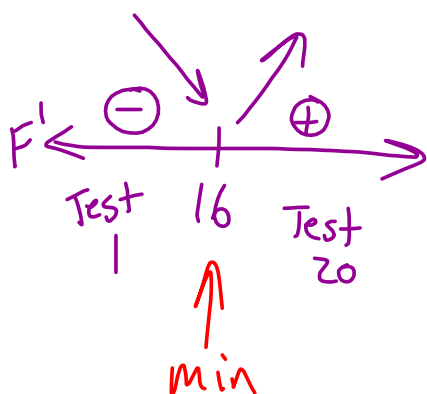
$x^2 \left(0 = 3 - \frac{768}{x^2} \right)$

$0 = 3x^2 - 768$

$\frac{768}{3} = \frac{3x^2}{3}$

$256 = x^2$

$\pm 16 = x$ reject -16
b/c $x > 0$



$x = 16$

Find y:

$384 = 16(y)$

$24 = y$

$16 \text{ m} \times 24 \text{ m}$